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Additions to the crane fly subgenus *Tipula* (*Vestiplex*) Bezzi, 1924 (Diptera, Tipulidae) for North Korea, with the description of a new species

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Abstract

A new crane fly species, *Tipula* (*Vestiplex*) *longistila* **sp. nov.** is described and illustrated from North Korea. Additionally, *Tipula* (*Vestiplex*) *dhalma* Starkevich & Podenas, 2011, previously known from the Far East of Russia and *Tipula* (*Vestiplex*) *verecunda* Alexander, 1924, previously known only from Jeju Island (South Korea), are newly recorded from North Korea. An updated identification key to the *Tipula* (*Vestiplex*) crane flies of the Korean Peninsula is provided.

Key Words

Distribution, hypopygium, new record, identification key, taxonomy, Tipulinae

Introduction

The crane flies of the family Tipulidae recorded in the Korean Peninsula include 93 species belonging to 12 genera (Yi 2024; Oosterbroek 2025). The genus *Tipula* Linnaeus, 1758 is represented by 15 subgenera (Oosterbroek 2025). Recent studies of Korean Tipulidae include the works of Baek and Bae (2016a, 2016b, 2017), Yi and Pilipenko (2023, 2024) and Yi (2024). A total of five *Tipula* (*Vestiplex*) Bezzi, 1924 species were known from the Korean Peninsula, which were taxonomically revised by Starkevich et al. (2021). The taxonomic review of the subgenus included the re-description of five species, a description of the last larval instar of *Tipula* (*Vestiplex*) *serricauda* Alexander, 1914 and an identification key for adult males and females. Amongst them, three species were re-described, supplemented with material collected by A. M. Yankovsky between 1937 and 1940 in North Korea.

The Catalogue of the Craneflies of the World accounts for 200 species of *Tipula* (*Vestiplex*) distributed in Holarctic and Oriental Realms (Oosterbroek 2025), with the highest species diversity documented in China — 104 species. Most of the species in this subgenus occur in mountain ranges where adults can be found at altitudes reaching 4,300 m (Savchenko 1960, 1964).

So far, the larvae of only eight species have been described (Alexander 1920; Chiswell 1956; Theowald 1967; Gelhaus 1986; Lantsov 2003; Podeniene 2003; Starkevich et al. 2021). The immature stages are terrestrial, developing in the uppermost layer of soil under leaf and needle litter or under mosses (Rogers 1942; Chiswell 1956; Theowald 1967; Teale and Gelhaus 1984; Lantsov 2003; Podeniene 2003).

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The present work aims to describe and illustrate a new species of *Tipula* (*Vestiplex*) from North Korea. Additionally, new and additional distribution records are provided for three species in North Korea. An updated and illustrated key for the species reported in the Korean Peninsula is included.

Materials and methods

Adult crane flies were collected by Wiesław Krzemiński and Edward Palik in 1981 and 1989, during the fifth and twelfth expeditions of researchers from the Institute of Systematics and Evolution of Animals of the Polish Academy of Sciences (ISEA PAS) to North Korea (Pawłowski and Tomek 1997).

Photographs of adult specimens were taken with a Nikon Z6III camera and Nikon NIKKOR Z MC 105 mm lens, with an additional Raynox DCR-250 conversion lens added when photographing the thorax.

The hypopygium was removed and boiled in 10% sodium hydroxide (NaOH) for 5–10 minutes, observed in glycerine under an Olympus SZX10 stereomicroscope. Photos of dissected terminalia were taken with a Teledyne Infinity 1 camera mounted on a Nikon Si-L stereomicroscope and a Canon Eos 6D camera and Mitutoyo 10× objective using an MJKZZ automated focus stacking rail set.

The obtained layers were stacked using the software Zerene Stacker and Helicon Focus, then edited with Adobe Photoshop.

Descriptive terminology of the adults follows Cumming and Wood (2017). The term "genital bridge" is adopted from Dobrotworsky (1968) and contains the sclerites sp1 and sp2 of Neumann (1958).

The material is deposited at the Institute of Systematics and Evolution of Animals, Polish Academy of Sciences (ISEA PAS), Kraków, Poland.

Results

A total of 14 specimens of the subgenus *Tipula* (*Vestiplex*) were studied. Four species were identified, including the description of a new species, *Tipula* (*Vestiplex*) *longistila* sp. nov. The species *Tipula* (*Vestiplex*) *dhalma* is being recorded for the first time in the Korean Peninsula from North Korea and *Tipula* (*Vestiplex*) *verecunda* is reported for the first time in North Korea. Furthermore, an additional record for *Tipula* (*Vestiplex*) *kuwayamai* is provided for the North Korean province of South Pyongyang. Thus, the *Tipula* (*Vestiplex*) fauna of North Korea now accounts for seven species.

Updated list of *Tipula* (*Vestiplex*) crane flies from the Korean Peninsula

Tipula (*Vestiplex*) *coquillettiana* Alexander, 1924
Tipula (*Vestiplex*) *dhalma* Starkevich & Podenas, 2011
Tipula (*Vestiplex*) *kuwayamai* Alexander, 1921
Tipula (*Vestiplex*) *longistila* sp. nov.
Tipula (*Vestiplex*) *serricauda* Alexander, 1914
Tipula (*Vestiplex*) *tchukchi* Alexander, 1934
Tipula (*Vestiplex*) *verecunda* Alexander, 1924

Key to Korean *Tipula* (*Vestiplex*) crane flies (updated from Starkevich et al. (2021))

Males

1 Gonocoxite armed with a strong black spine or horn-shaped (Fig. 7A, B) 2
– Gonocoxite unarmed, simple (Fig. 7C) 4
2 Flagellum bicoloured with an inconspicuous basal enlargement. Gonocoxite with a strong black spine (Fig. 7B). Tergite 9 divided by a pale mid-line (Fig. 7D) ..... *Tipula* (*Vestiplex*) *serricauda* Alexander, 1914
– Flagellum dark brown with a basal enlargement. Gonocoxite horn-shaped. Tergite 9 forming a sclerotised saucer-shaped plate (Figs 2B, 3A, 7E, F) 3
3 Flagellomeres straight, with one weak basal enlargement. Gonocoxite with horn bifurcated at margin (Fig. 7A). Tergite 9 with anterior margin reaching lateral part of tergal saucer (Fig. 7E) ..... *Tipula* (*Vestiplex*) *coquillettiana* Alexander, 1924
– Flagellomeres with conspicuous, basal and pre-apical enlargements, distal segments nearly sinuous in shape (Fig. 5A). Gonocoxite with horn not bifurcated at margin. Tergite 9 with anterior margin not reaching lateral part of tergal saucer (Fig. 7F) ..... *Tipula* (*Vestiplex*) *dhalma* Starkevich & Podenas, 2011
4 Sternite 8 with long setae (Fig. 7G). Sternite 9 with a median tubercle, ventrally. Appendage of sternite 9 present, finger-shaped. Tergite 9 divided by a pale mid-line ..... *Tipula* (*Vestiplex*) *verecunda* Alexander, 1924
– Sternite 8 without long setae. Sternite 9 without ventral tubercle (Fig. 7G). Appendage of sternite 9 absent. Tergite 9 forming a sclerotised saucer (Figs 2B, 3A) 5
5 Inner gonostylus elongated, apically claw-shaped (Figs 2A, 3D) ..... *Tipula* (*Vestiplex*) *longistila* sp. nov.
– Inner gonostylus short, apex with small denticle 6
6 Size relatively small (body length: 16.8 mm; wing length: 17.1 mm). Wing pattern indistinct, only weak darkening along vein CuA. Abdomen with median stripe ..... *Tipula* (*Vestiplex*) *tchukchi* Alexander, 1934
– Size large (body length: 17.8–19.7 mm; wing length: 19.8–22.9 mm). Wing distinctly marbled. Abdomen without median stripe ..... *Tipula* (*Vestiplex*) *kuwayamai* Alexander, 1921

Females

1 Wing well developed, extending beyond middle of abdomen 2
– Wing reduced, not reaching middle of abdomen ..... *Tipula* (*Vestiplex*) *coquillettiana* Alexander, 1924
2 Wing pattern indistinct, only weak darkening along vein CuA. Cercus apically with incision in addition to serrated border (Fig. 8A) ..... *Tipula* (*Vestiplex*) *tchukchi* Alexander, 1934
– Wing pattern distinctly marbled. Cercus without apical incision (Fig. 8B) 3
3 Posterolateral angles of sternite 8 extended into distinct lobes (Fig. 8C) .... *Tipula* (*V.*) *dhalma* Starkevich & Podenas, 2011
– Posterolateral angles of sternite 8 without lobes 4
4 Cercus with smooth ventral margin (Fig. 8B). Hypogynial valve long, blade-shaped (Fig. 8E) ..... *Tipula* (*Vestiplex*) *verecunda* Alexander, 1924
– Cercus with serrate ventral margin (Fig. 8A). Hypogynial valve short, filamentous or plate-shaped (Fig. 8C, D) 5
5 Larger species with a wing length of 24.5–26.1 mm. Hypogynial valve filamentous ..... *Tipula* (*Vestiplex*) *kuwayamai* Alexander, 1921
– Smaller species with a wing length of 16.4–17.1 mm. Hypogynial valve in the shape of a dark brown plate (Fig. 8D) .... *Tipula* (*Vestiplex*) *serricauda* Alexander, 1914

Taxonomy

Class Insecta Linnaeus, 1758
Order Diptera Linnaeus, 1758
Family Tipulidae Latreille, 1802
Subfamily Tipulinae Latreille, 1802
Genus *Tipula* Linnaeus, 1758
Subgenus *Vestiplex* Bezzi, 1924

Tipula (*Vestiplex*) *longistila* sp. nov.

https://zoobank.org/6DF3CC18-B166-4C2D-8E6C-1D00D19B72CC

Figs 1–4

Type material. ***Holotype.*** **NORTH KOREA** • ♂ (pinned), labelled: North Korea – Sanjiyon [Samjiyon, Ryanggang Prov.]; 41.8°N, 128.3°E; 3.VIII.1989; leg. E. Palik; ISEA PAS.

Paratype. **NORTH KOREA** • 1 ♂ same data as holotype (pinned, with genitalia in microvial under the specimen); ISEA PAS.

Diagnosis. *Tipula* (*Vestiplex*) *longistila* sp. nov. can be recognised by the elongate antenna reaching beyond wing base and the yellow, trivittate abdomen. Male tergite 9 with lateral corners produced into horns, inner gonostylus elongate, apically claw-shaped with acute, thorn-shaped lower beak.

Description. Male. Body length: 16.4–17.3 mm; wing length: 17.4–17.8 mm; antenna length: 5.3–5.5 mm (n = 2). Body with brown thorax and yellow abdomen (Fig. 1).

Head. Yellowish-brown, vertex and occiput dusted with grey and with median brown line. Rostrum yellowish-brown with short nasus. Antenna 13-segmented, reaching beyond wing base if bent backwards (Fig. 1A). Scale, pedicel and first flagellar segment yellow; the second flagellar segment

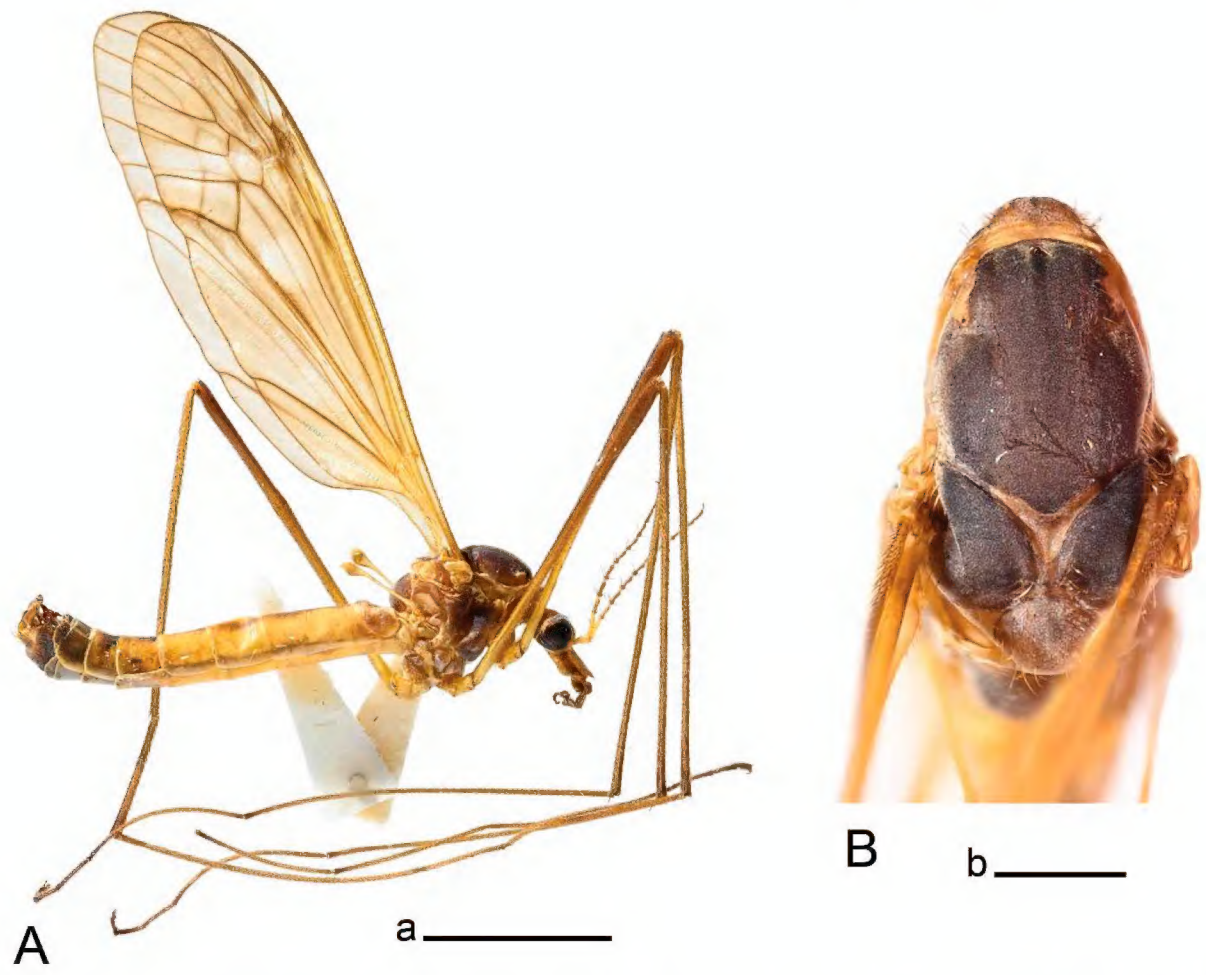

Figure 1. Habitus of *Tipula* (*Vestiplex*) *longistila* sp. nov., male, holotype. **A.** Lateral view; **B.** Thorax, dorsal view. Scale bars: 5 mm (**A**); 1 mm (**B**).

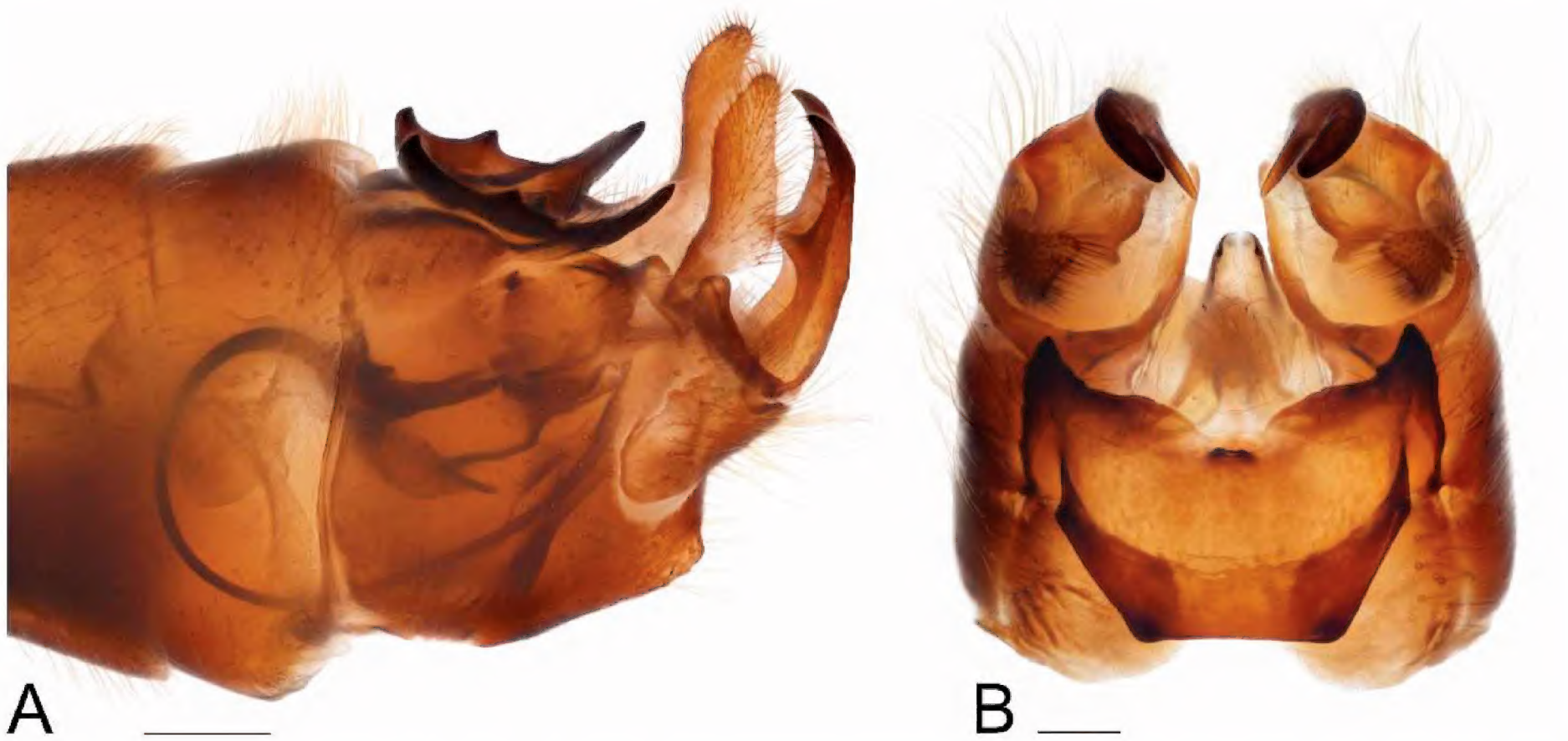

Figure 2. Male terminalia of *Tipula* (*Vestiplex*) *longistila* sp. nov., paratype. **A.** Hypopygium, lateral view; **B.** Hypopygium, dorsal view. Scale bars: 0.5 mm.

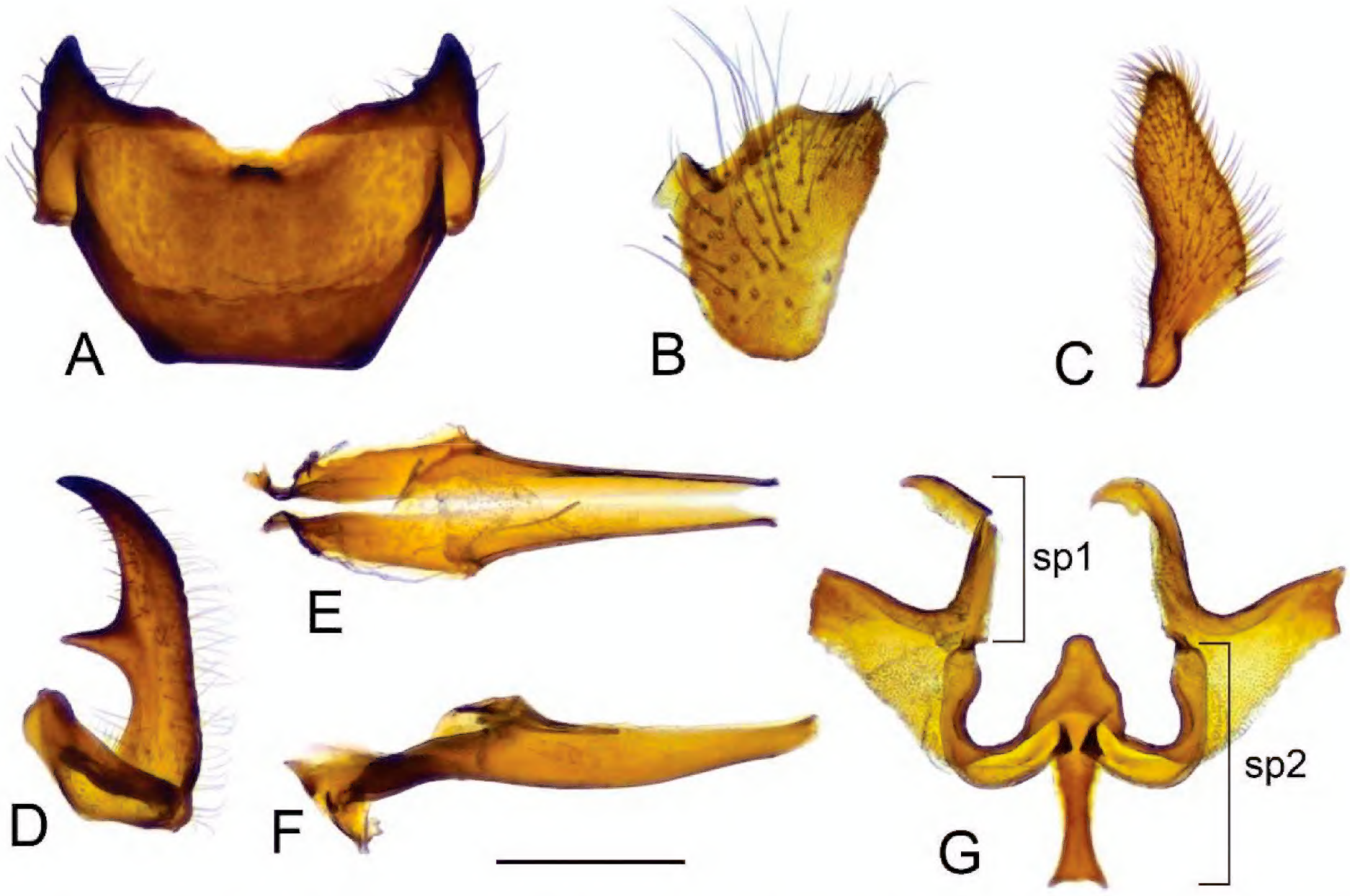

Figure 3. Male terminalia of *Tipula* (*Vestiplex*) *longistila* sp. nov., paratype. **A.** Tergite 9, dorsal view; **B.** Left gonocoxite, lateral view; **C.** Left outer gonostylus; **D.** Left inner gonostylus, outer lateral view; **E.** Adminiculum, dorsal view; **F.** Adminiculum, lateral view; **G.** Genital bridge, dorsal view (apical part of right sp1 damaged during dissection). Abbreviations: sp1, sclerite sp1 of genital bridge; sp2, sclerite sp2 of genital bridge. Scale bars: 0.5 mm (**A–G**).

yellowish-brown, darkened at base, remaining segments brown. Flagellar segments, except first and last, slightly sinuous, terminal flagellar segment small. Longest verticils subequal in length to corresponding segments. Whole flagellum densely covered with short, light-yellow setae. Palpus brown.

Thorax. Pronotum yellowish-brown with brown median line (Fig. 1B). Prescutum and presutural scutum dark brown, with four longitudinal, bordered stripes, the median pair fused. Postsutural scutum with each scutal lobe with two bordered spots. Scutellum brown with darker brown longitudinal line.

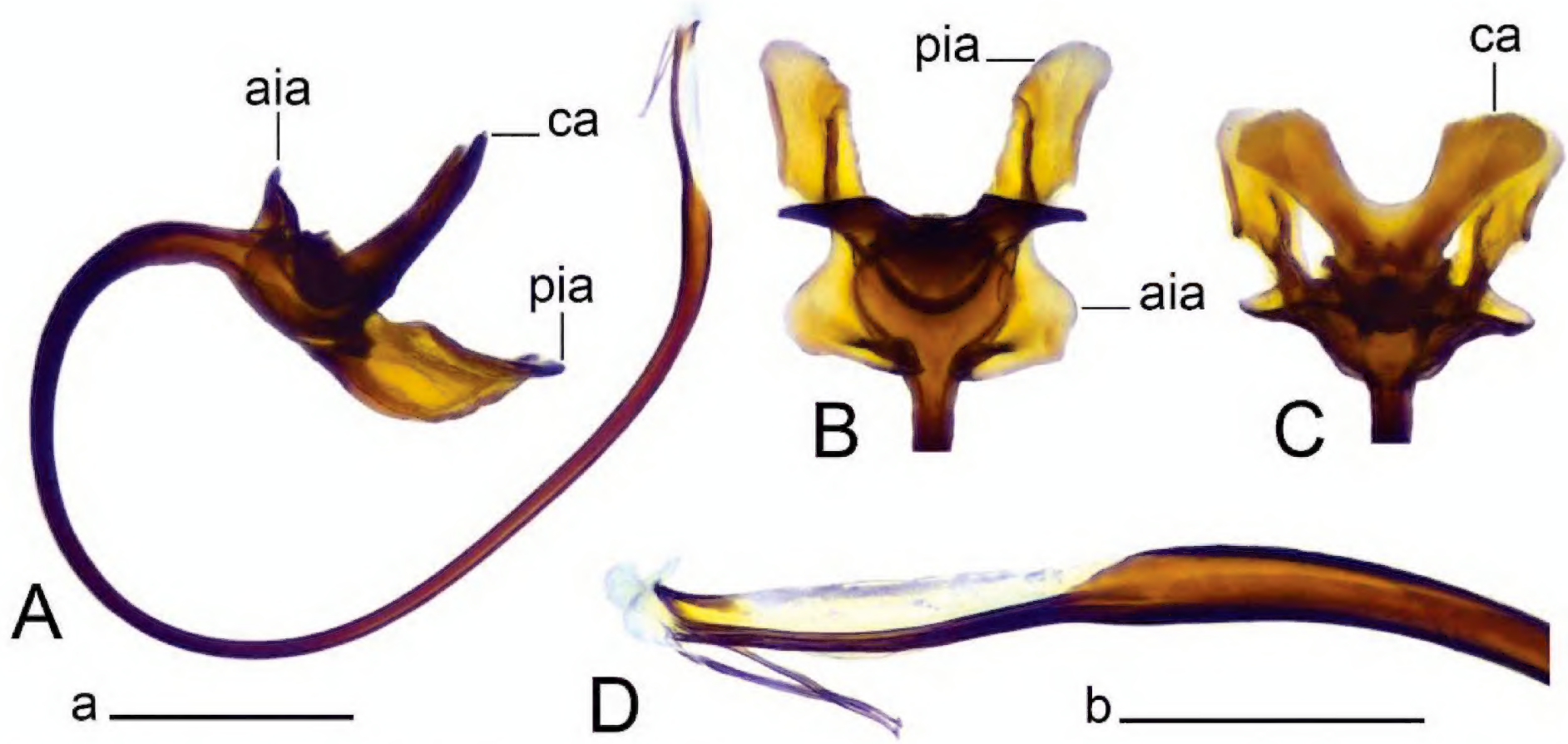

Figure 4. Male terminalia of *Tipula* (*Vestiplex*) *longistila* sp. nov., paratype. **A.** Sperm pump and aedeagus, lateral view; **B.** Sperm pump, caudal view; **C.** Sperm pump, dorsal view; **D.** Apical part of aedeagus. Abbreviations: aia, anterior immovable apodeme; ca, compressor apodeme; ml, median lobe; pia, posterior immovable apodeme. Scale bars: 0.5 mm (**A–C**); 0.25 mm (**D**).

Legs with coxae brownish-yellow. Trochanters yellow, femora yellow at basal half, becoming progressively browner towards tip. Remaining segments yellowish-brown. Tarsal claws with basal tooth. Wing patterned, tinged with brown. Halter yellowish, with darker spot on halter stem.

Abdomen. Tergites 1–5 and sternites 1–4 yellow, tergites longitudinally trivittate (Fig. 1A). Tergite 6 and sternite 5 yellowish-brown, remaining segments brown.

Hypopygium (Figs 2–4). Tergite 9 with large concave, sclerotised saucer (Figs 2, 3A). Main body of tergal saucer brown, with blackened rim. Posterior margin of tergal saucer broadly emarginated, with broad median, split tooth. Posterolateral angles extended, blackened, nearly horn-shaped. Lateral and anterior angles produced into obtuse teeth. Gonocoxite apically without outgrowth (Figs 2, 3B). Outer gonostylus narrow at base, rest of sclerite slightly curved and flattened, apex narrowing (Fig. 3C). Inner gonostylus with base curved at a right angle, rest of body elongated, beak darkened, claw-shaped, lower beak acute, thorn-shaped (Figs 2A, 3D). Adminiculum shaped like narrow tube (Fig. 3E), resembling a boat, laterally (Fig. 3F). Genital bridge with sclerite sp1 well developed, bilobed (Fig. 3G). Sclerite sp2 with elongated anterior apodeme, posterior apodeme extended at apex, hood-shaped. Sperm pump with central vesicle flattened (Fig. 4A, B). Compressor apodeme with deep, U-shaped median incision. Posterior immovable apodeme elongated, anterior immovable apodeme rounded. Aedeagus elongate, tubular, dark brown, 4.3× as long as sperm pump. Distal part ventrally membranous, nearly shovel-shaped with two apical filaments (Fig. 4D).

Female. Unknown.

Etymology. The specific epithet is a combination of the Latin words "longus", meaning long, and "stilus", meaning pointed, forming the epithet "longistila" in allusion to the elongate inner gonostylus.

Distribution. North Korea, Ryanggang Province.

Remarks. *Tipula* (*Vestiplex*) *longistila* sp. nov. belongs to the *leucoprocta* species group (Savchenko 1960, 1964; Starkevich et al. 2020, 2022). The males of the *leucoprocta* species group are recognised by an unarmed gonocoxite, tergite 9 possessing a large, sclerotised plate with an extensive saucer with a raised border, posterolaterally terminating in teeth and a large genital bridge.

The new species is morphologically similar to *Tipula* (*Vestiplex*) *quadricorna* Ren, Li & Yang, 2021 (China, Ningxia) in having an elongated inner gonostylus (Ren et al. (2021): fig. 28). Even so, the new species can be separated by tergite 9 having posterolaterally extended horn-shaped lobes and a split median tooth, by the inner gonostylus with a claw-shaped apex and acute lower beak and a simple gonocoxite. In *Tipula* (*Vestiplex*) *quadricorna*, the posterolateral corners of tergite 9 are not extended into horns, the median tooth is missing, the inner gonostylus lacks a lower beak, with the apex nearly straight and obtuse and the gonocoxite is elongated into a lobe with an additional process in the middle (Ren et al. (2021): figs 25–29).

The darker brown thoracic segments with colouration changed after post-mortem processes, presumably with the same colouration as pronotum and scutellum.

Tipula (*Vestiplex*) *dhalma* Starkevich & Podenas, 2011

Fig. 5

Tipula (*V.*) *dhalma* Starkevich & Podenas, 2011: 142 (orig. desc.).

Material examined. NORTH KOREA • 1 ♂, 2 ♀♀ (pinned); Ryanggang Prov., Samjiyon; 3.VIII.1989; leg. E. Palik; ISEA PAS.

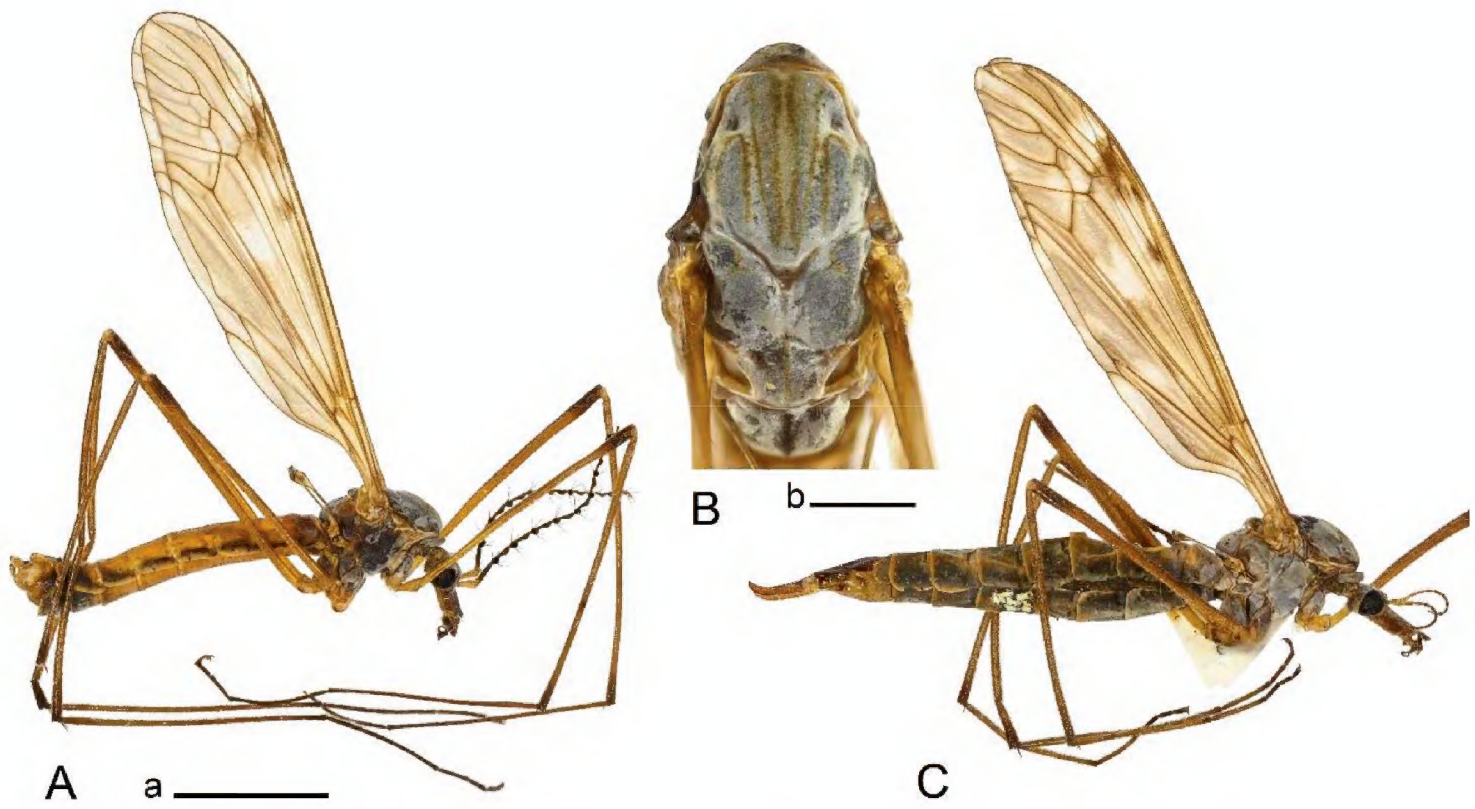

Figure 5. Habitus of *Tipula* (*Vestiplex*) *dhalma* (North Korea). **A.** Male, lateral view; **B.** Male thorax, dorsal view; **C.** Female, lateral view. Scale bars: 5 mm (**A**); 1 mm (**B**).

Distribution. *Tipula* (*Vestiplex*) *dhalma* was described from the Russian Far East (Starkevich and Podenas 2011). Here, it is reported for the first time from North Korea.

Remarks. Amongst Korean *Tipula* (*Vestiplex*) species, males of *Tipula* (*Vestiplex*) *dhalma* can be recognised by the elongated antenna reaching the abdomen if bent backwards (Fig. 5A), with flagellar segments enlarged at base and apex; the distal flagellomeres are nearly sinuous in shape. Wing tinged with brown, thorax grey, prescutum and presutural scutum with four stripes, bordered by brown (Fig. 5B). Intermediate pair of stripes greyish-brown, separated by light brown, lateral stripes grey. Postsutural scutum grey, each lobe with two grey spots, bordered by brown. Abdomen yellow. Females are generally similar to males in body colouration (Fig. 5C), except for nearly bicoloured antenna. Ovipositor with tip upraised. Sternite 8 with posterolateral angles extended into distinct lobes, hypogynial valves elongated, filamentous (Starkevich and Podenas (2011): fig. 7).

Tipula (*Vestiplex*) *kuwayamai* Alexander, 1921

Tipula kuwayamai Alexander, 1921: 130 (orig. desc.); Alexander, 1925: 93.
Tipula (*Vestiplex*) *kuwayamai*: Alexander (1934: 405; 1935: 118); Savchenko (1964: 179); Oosterbroek and Theowald (1992: 156); Starkevich et al. (2021: 32).

Material examined. NORTH KOREA • 1 ♀ (pinned); South Pyongyang Prov., Paeksong-ir; 15.VI.1981; leg. W. Krzemiński; ISEA PAS.

Distribution. *Tipula* (*Vestiplex*) *kuwayamai* is known from the Russian Far East, China, Japan, North and South Korea (Oosterbroek 2025). Here, an additional record for the North Korean province of South Pyongyang.

Remarks. Amongst Korean *Tipula* (*Vestiplex*) species, the male of *Tipula* (*Vestiplex*) *kuwayamai* can be recognised by a brownish-yellow body and a distinctly patterned wing (Starkevich et al. 2021). Gonocoxite is unarmed, tergite 9 with a sclerotised, oval saucer-shaped plate which has an elevated anterior edge. Female with cercus brownish-yellow, tip narrowed and upturned. Hypogynial valves are filamentous. The female has the cercus brownish-yellow, the tip narrowed and upturned, ventral margin with distinct serration. The median incision between hypogynial valves is slightly deeper than posterior margin of sternite 8.

Tipula (*Vestiplex*) *verecunda* Alexander, 1924

Fig. 6

Tipula verecunda Alexander, 1924: 606 (orig. desc.).
Tipula (*V.*) *verecunda*: Alexander 1935: 118; Savchenko 1964: 152; Oosterbroek and Theowald 1992: 160; Starkevich et al. 2021: 48.

Material examined. NORTH KOREA • 2 ♂♂ (pinned); South Pyongyang Prov., Paeksong-ir; 15.VI.1981; leg. W. Krzemiński; ISEA PAS • 2 ♂♂, 3 ♀♀ (pinned); South/North Pyongyang Prov. Myohyang-san; 22–25.VI.1981; leg. W. Krzemiński; ISEA PAS • 1♂ (pinned); South/North Pyongyang Prov. Myohyang-san; 22.VI.1981; leg. W. Krzemiński; ISEA PAS.

Distribution. *Tipula* (*Vestiplex*) *verecunda* is known from the Russian Far East, China, Japan and South Korea (Jeju Island) (Oosterbroek 2025). This species is recorded here for the first time from North Korea.

Remarks. Amongst Korean *Tipula* (*Vestiplex*) species, the male of *Tipula* (*Vestiplex*) *verecunda* can be recognised by the yellow body colouration with abdomen blackened at the tip, marbled wings, sternite 8 bearing long setae and sternite 9 having a ventral tubercle (Fig. 6A). Prescutum and presutural scutum, with four ochraceous-grey stripes (Fig. 6B), bordered by brown, interspaced light yellow. Postsutural scutal with each lobe having two ochraceous brownish-yellow spots bordered by brown. Females are generally similar to males in body colouration (Fig. 6C) with cercus straight and smooth. Hypogynial valves elongated, blade-shaped.

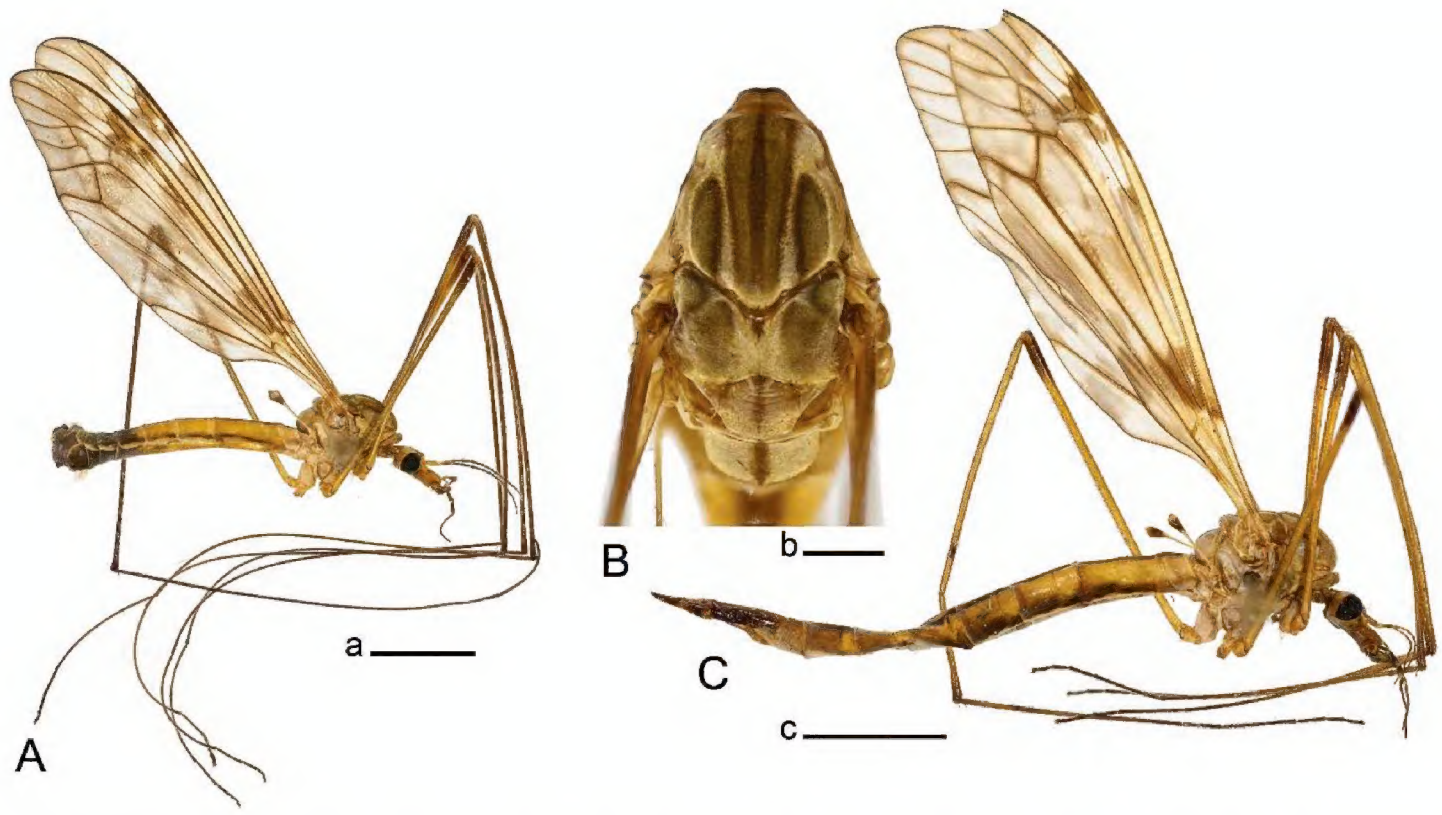

Figure 6. Habitus of *Tipula* (*Vestiplex*) *verecunda* (North Korea). **A.** Male, lateral view; **B.** Male thorax, dorsal view; **C.** Female, lateral view. Scale bars: 5 mm (**A, C**); 1 mm (**B**).

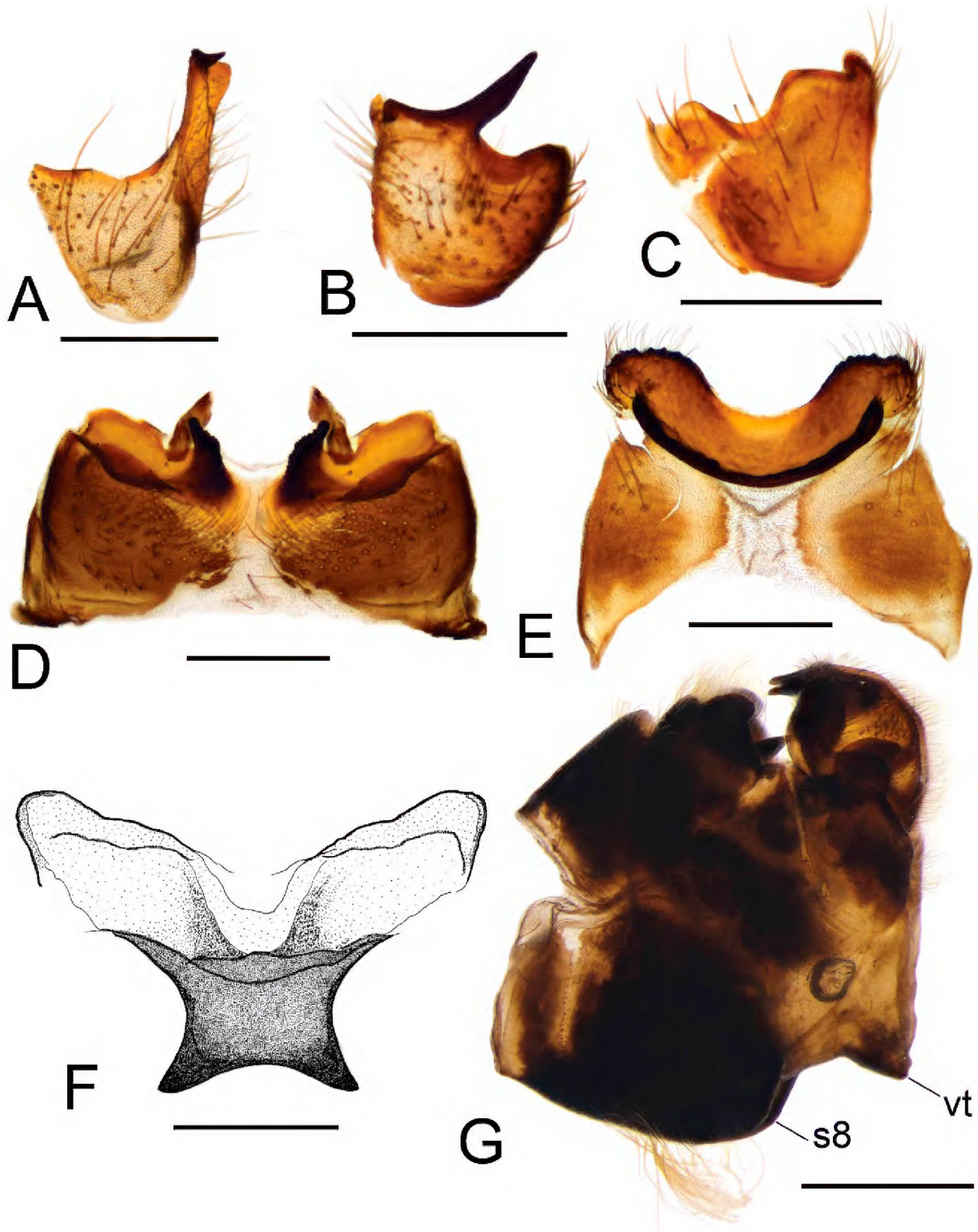

Figure 7. Male terminalia of *Tipula* (*Vestiplex*) (A–E and G: modified from Starkevich et al. (2021); F: modified from Starkevich and Podenas (2011)). **A.** Gonocoxite of *T.* (*V.*) *coquillettiana*; **B.** Gonocoxite of *T.* (*V.*) *serricauda*; **C.** Gonocoxite of *T.* (*V.*) *tchukchi*; **D.** Tergite 9 of *T.* (*V.*) *serricauda*; **E.** Tergite 9 of *T.* (*V.*) *coquillettiana*; **F.** Tergite 9 of *T.* (*V.*) *dhalma*; **G.** Hypopygium of *T.* (*V.*) *verecunda*, lateral view. Abbreviations: s8, sternite 8; vt, ventral tubercle. Scale bars: 5 mm (**A–F**); 1 mm (**G**).

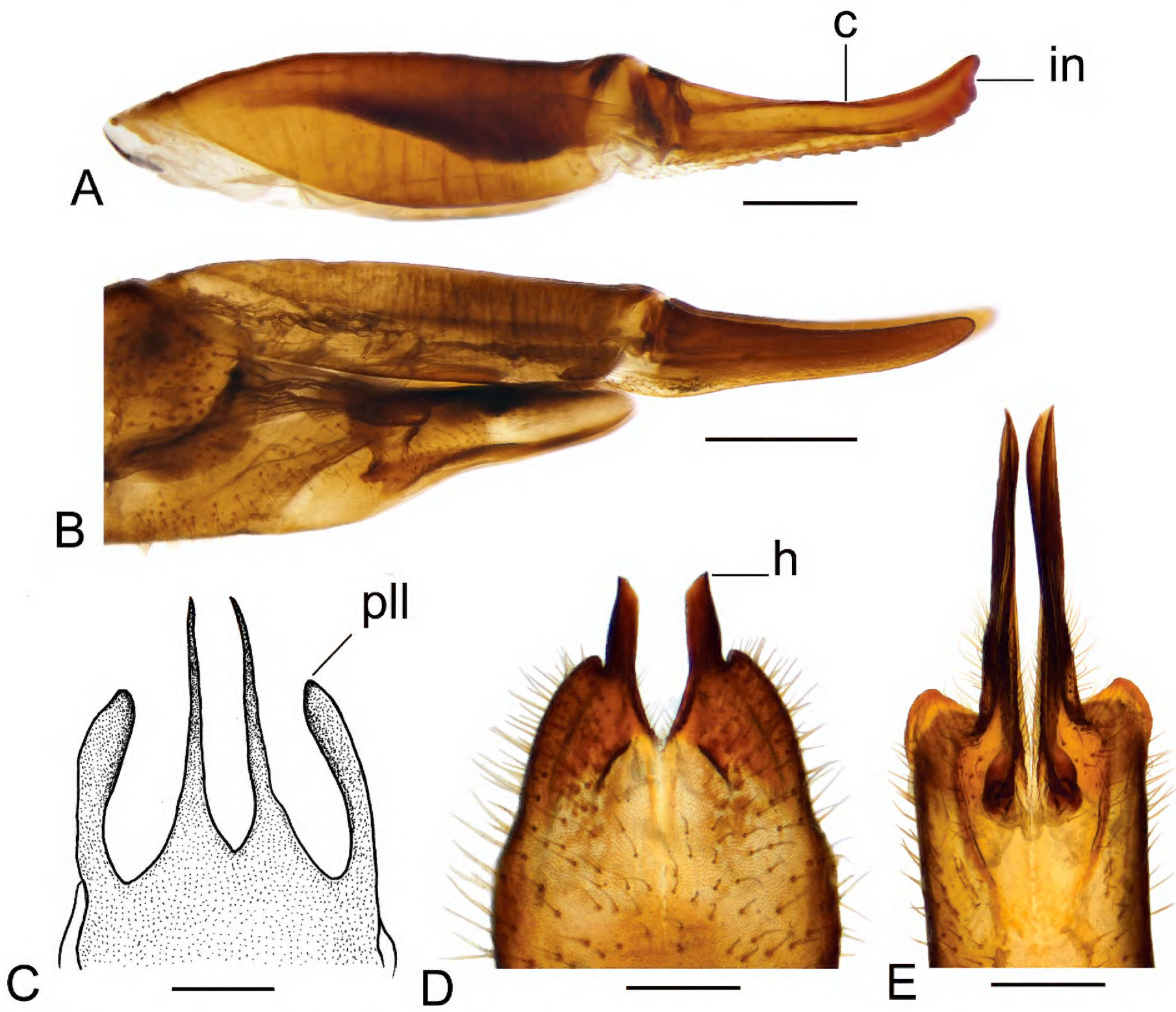

Figure 8. Female terminalia of *Tipula* (*Vestiplex*) (A–B, D–E: modified from Starkevich et al. (2021); C: modified from Starkevich and Podenas (2011)): **A.** Tergite 10 and cercus *T.* (*V.*) *tchukchi*; **B.** Ovipositor of *T.* (*V.*) *verecunda*; **C.** Distal part of sternite 8 with hypogynial valves of *T.* (*V.*) *dhalma*; **D.** Distal part of sternite 8 with hypogynial valves of *T.* (*V.*) *serricauda*; **E.** Distal part of sternite 8 with hypogynial valves of *T.* (*V.*) *verecunda*. Abbreviations: c, cercus; h, hypogynial valve; in, incision; pll, posterolateral lobe of sternite 8. Scale bars: 1 mm (**A, B**); 1 mm (**C–E**).

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References

Alexander CP (1920) The crane-flies of New York. Part II. Biology and phylogeny. Memoirs. Cornell University Agricultural Experiment Station 38: 691–1133. https://doi.org/10.5962/bhl.title.33641

Alexander CP (1921) Undescribed species of Japanese crane-flies (Tipulidae, Diptera). Part II. Annals of the Entomological Society of America 14(2): 111–134. https://doi.org/10.1093/aesa/14.2.111

Alexander CP (1924) New or little-known crane flies from northern Japan (Tipulidae, Diptera). Philippine Journal of Science 24: 531–611.

Alexander CP (1925) New or little-known crane-flies. Part I. Encyclopedie Entomologique, (B II). Diptera 2: 87–93.

Alexander CP (1934) New or little-known Tipulidae from eastern Asia (Diptera). XVII. Philippine Journal of Science 52: 395–442.

Alexander CP (1935) New or little-known Tipulidae from eastern Asia (Diptera). XXV. Philippine Journal of Science 57: 81–148.

Baek HM, Bae YJ (2016a) New records of the genus *Tipula* (Diptera: Tipulidae: Tipulinae) in Korea. Entomological Research Bulletin 32: 161–164.

Baek HM, Bae YJ (2016b) A new species of *Indotipula* (Diptera: Tipulidae) from Korea. Entomological Research Bulletin 32: 165–167.

Baek HM, Bae YJ (2017) Taxonomic review of the Korean Tipulinae (Diptera: Tipulidae). Entomological Research Bulletin 33: 20–31.

Chiswell JR (1956) A taxonomic account of the last instar larvae of some British Tipulinae (Diptera: Tipulidae). Transactions of the Royal Entomological Society of London 108(10): 409–484. https://doi.org/10.1111/j.1365-2311.1956.tb01273.x

Cumming JM, Wood DM (2017) Adult morphology and terminology. In: Kirk-Spriggs AH, Sinclair BJ (Eds) Manual of Afrotropical Diptera, Volume 1: Introductory Chapters and Keys to Diptera Families. Suricata 4. South African National Biodiversity Institute, Pretoria, 89–133.

Dobrotworsky N (1968) The Tipulidae (Diptera) of Australia I. A review of the genera of the subamily Tipulinae. Australian Journal of Zoology 16(3): 459–494. https://doi.org/10.1071/ZO9680459

Gelhaus JK (1986) Larvae of the crane fly genus *Tipula* in North America (Diptera: Tipulidae). The University of Kansas Science Bulletin 53: 121–182. https://doi.org/10.5281/zenodo.15972016

Lantsov VI (2003) Biology, ecology and preimaginal stages of the crane fly *Tipula semivittata semivittata* (Diptera, Tipulidae). Entomological Review 83: 906–913.

Neumann H (1958) Der Bau und die Funktion der männlichen Genitalapparate von *Trichocera annulata* Meig. und *Tipula paludosa* Meig. (Dipt. Nematocera). Deutsche Entomologische Zeitschrift 5: 235–298.

Oosterbroek P (2025) Catalogue of the Craneflies of the World (CCW). https://ccw.naturalis.nl/index.php (consulted June 15, 2025).

Oosterbroek P, Theowald B (1992) Family Tipulidae. In: Soós Á, Papp L (Eds) Catalogue of Palaearctic Diptera 1. Hungarian Natural History Museum, Budapest, 56–178.

Pawłowski J, Tomek T (1997) Zoological expeditions to the North Korea organized in the years 1971–1992 by the Cracow Institute of Systematics and Evolution of Animals of the Polish Academy of Sciences. Fragmenta Faunistica 40(19): 231–246. https://doi.org/10.3161/00159301FF1997.40.19.231

Podeniene V (2003) Morphology and ecology of the last instar larvae of the crane flies (Diptera, Tipulomorpha) of Lithuania. Doctoral dissertation, Vilnius University 1–295.

Ren J, Li Y, Yang D (2021) Two new species of *Tipula* (*Vestiplex*) Bezzi (Diptera, Tipulidae) from Northwest China. Zootaxa 4903(3): 373–392. https://doi.org/10.11646/zootaxa.4903.3.4

Rogers JS (1942) The crane flies (Tipulidae) of the George Reserve, Michigan. Miscellaneous Publications (University of Michigan. Museum of Zoology) 53: 1–128. https://doi.org/10.1093/aesa/35.4.477

Savchenko EN (1960) A contribution to the taxonomy of crane-flies (Diptera, Tipulidae) of the subgenus *Vestiplex* Bezzi of the genus *Tipula* L. Horae Societatis Entomologicae Rossicae Unionis Soveticae 47: 143–216.

Savchenko EN (1964) Crane-flies (Diptera, Tipulidae), Subfam. Tipulinae, Genus *Tipula* L., 2. Fauna USSR, N.S. 89, Insecta Diptera 1–503.

Savchenko EN (1983) Crane-flies (Fam. Tipulidae), Introduction, Subfam. Dolichopezinae, subfam. Tipulinae (start). Fauna USSR, N.S. 127. Insecta Diptera 2(1–2): 1–585. [in Russian]

Starkevich P, Podenas S (2011) A new species of long-palped crane fly in the subgenus *Tipula* (*Vestiplex*) [Diptera: Tipulidae] from the Far East of Russia. Transactions of the American Entomological Society 137(1 & 2): 141–147. https://doi.org/10.3157/061.137.0103

Starkevich P, Podenas S, Gelhaus JK (2020) Taxonomic review of *Tipula* (*Vestiplex* Bezzi) crane flies (Diptera: Tipulidae) in Mongolia. Zootaxa 4837(1): 1–88. https://doi.org/10.11646/zootaxa.4837.1.1

Starkevich P, Podėnas S, Podėnienė V, Park SJ, Kim AY (2021) *Tipula* (*Vestiplex*) crane flies (Diptera, Tipulidae) of Korea. ZooKeys 1061: 23–55. https://doi.org/10.3897/zookeys.1061.49999

Starkevich P, Podėnas S, Sivell D (2022) *Tipula* (*Vestiplex*) *levisoni* sp. nov., a new cranefly (Diptera, Tipulidae) from the Western Himalayas. Zootaxa 5115(1): 131–145. https://doi.org/10.11646/zootaxa.5115.1.9

Teale SA, Gelhaus JK (1984) Natural history and synonymy of *Tipula* (*Vestiplex*) *platymera* Walker (Diptera: Tipulidae) with description of the larvae and pupae. Journal of the Kansas Entomological Society 57: 423–429.

Theowald B (1967) Familie Tipulidae (Diptera, Nematocera). Larven und Puppen. Bestimmungsbucher zur Bodenfauna Europas 7: 1–100.

Yi DA (2024) New distributional records of the genus *Brithura* Edwards and twelve species of the genus *Tipula* (Diptera: Tipulidae: Tipulinae) from South Korea. Entomological Research Bulletin 40(1): 38–47.

Yi DA, Pilipenko VE (2023) *Tipula* (*Pterelachisus*) *submitophora* sp. nov., a new crane fly species (Diptera: Tipulidae) from South Korea. Zoosystematica Rossica 32(2): 231–244. https://doi.org/10.31610/zsr/2023.32.2.231

Yi DA, Pilipenko VE (2024) Contribution to the systematics of the subgenus *Tipula* (*Schummelia*) (Diptera: Tipulidae), with the description of a new species from South Korea. Zoosystematica Rossica 33(2): 346–362. https://doi.org/10.31610/zsr/2024.33.2.346